EFFECT OF CROPPING ON SOIL BACTERIA

Brown (Centralbl. Bakt. Abt. 2, XXXV, 1912, p. 248) has studied the effect of different kinds of cropping on the bacterial content of the soil. He finds that the number of microorganisms in the soil is much increased by rotation of crops as compared with continuous cropping. The same is true of the nitrifying and nitrogen-fixing powers of the soil. He compares various systems of alternation of crops in this regard. He also discusses the effect of turning under clover, as green manure. He claims that the two year rotation with green manuring is not so effective in increasing the bacteria and bacterial products as the longer term rotations. It is shown that the productivity of the soil is closely related to the bacterial activities within it.

ALTERNATION OF GENERATION IN THE PHÆOPHYCEÆ

In a beautifully illustrated article (Bot. Gaz. Dec. 1912) Yamanouchi gives, from the study of the nuclear and experimental conditions, the grounds for believing that *Cutleria multifida* is the gametophytic phase of a species of which *Aglaozonia reptans* is the sporophytic stage. The nuclei of both male and female Cutleria plants contain 24 chromosomes, which is true also of the gametes themselves. The sporelings resulting from the union of these gametes contain 48 chromosomes and develop into an Aglaozonia form similar to *A. reptans* in nature. On the other hand the nuclei of *Aglaozonia reptans* contain 48 chromosomes, which is reduced in zoospore formation to 24. These zoospores germinate without conjugation, and produce plants similar to young Cutleria in nature, and with 24 chromosomes.

EXPERIMENTS ON THE GERMINATION OF TELEUTOSPORES

Dietel (Centralbl. Bakt. II. 31:95. 1911) reports on the effects of age and temperature and drying, etc., on the germination of teleutospores of *Melampsora*. In the early spring these spores germinate in about 3 days if brought into favorable conditions of temperature and moisture. As the spores grow older the time necessary to germinate decreases. This might be due either to internal ripening or to the progressive changes in the spring tempera-

ture. Temporary drying hastened germination; strong light delayed it; temporary freezing had no effect. Germination takes place at 6°-10° C., but is hastened by higher temperature of 15°-20°.

DIRECTION OF LOCOMOTION IN STARFISH

Cole (Jour. Exp. Zool. Jan. 1913) finds that *Asterias forbesi* in the absence of directive stimuli, in crawling advances most frequently with that part of the body forward in which the madreporite occurs. He found a tendency in these animals to persist in moving with the same parts foremost in a series of succeeding trials; tho there is also a tendency to shift or "rotate" this anterior point successively to other parts. The author thinks the madreporic body may be what determines anteriorness, and shows that the "physiological anterior" of the starfish corresponds in this respect to the anterior parts of the more bilateral spatangoids.

A ROTIFER PARASITIC IN EGG OF WATER SNAILS

Stevens (Jour. Queck. Micr. Club., Nov. 1912) describes a rotifer of the genus Proales which is able to bite a small opening in the tough egg membrane of the snail *Limnaea auricularia,* and by squeezing thru this enters the more fluid portion within. The rotifer feeds on the fluid gelatin of the egg with an occasional attack on the snail embryo itself. As the result of these attacks the snail embryo is finally killed.

In the meantime the rotifer lays its eggs, and later leaves this to enter still other eggs. The larvae hatch and undergo their development, devouring the dead snail embryo and other available substance of the egg. They too later escape and enter other eggs.

This looks somewhat like a parasite in the making. The author says the rotifers do not seem "at home" in the water while making their way from egg to egg.

EUGLENIDS AND THEIR AFFINITIES

Alexieff (Arch. Zool. Exp. Notes et Rev., No. 4. 1912) in connection with the discussion of certain euglenoid forms that are partly or largely parasitic on other animals, makes some interesting suggestions as to the relationships of Protozoa. He thinks the Euglenids